

1895

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The "Victor" Automatic Ice Machine.



Especially Designed for Small Plants

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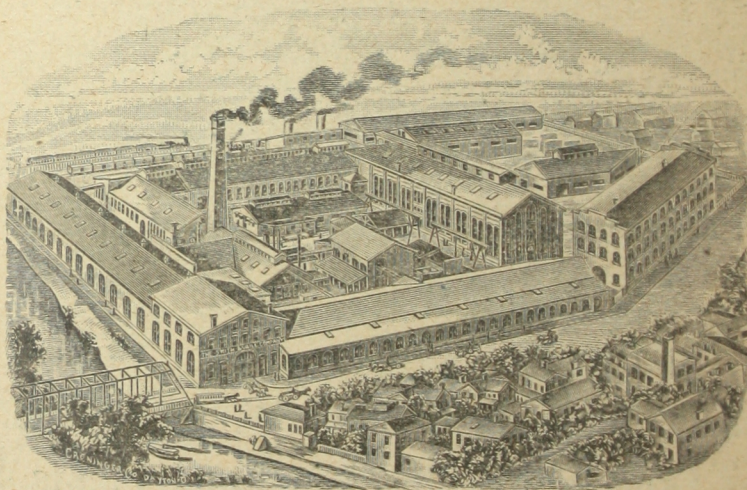
The Stilwell-Bierce & Smith-Vaile Co.,
Dayton, Ohio.
U.S.A.

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REFERENCE. PAMPHLET.



BIRDSEYE VIEW OF OUR "EAST SHOPS."

The Stilwell-Bierce & Smith-Vaile Co.

(Capital, \$1,000,000.)

Manufacturers of

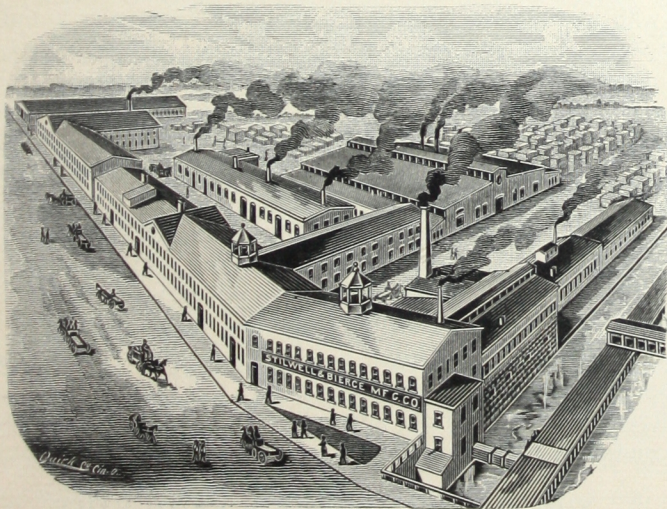
“THE VICTOR”

Automatic Ice and Refrigerating Machines.

Especially Designed for Small and Medium Plants.

Ranging from 500-lb. to 50-ton Refrigeration Capacity.

For the use of Breweries, Packing Houses, Soap Manufacturers, Meat Markets, Oil Mills, Hotels and Restaurants, Creameries, Steam Ships, Railroad Depots, and for all purposes requiring Ice or Cold Storage or both.



BIRDSEYE VIEW OF OUR “WEST SHOPS.”

Absolute Safety, Perfect Work, and Long Life of Machinery Guaranteed.

DAYTON, OHIO, U. S. A.

DAYTON, OHIO:
THE WHITE PRINTING CO.
1895.

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THE "VICTOR" ICE MACHINE.

IN presenting to the consideration of the public our new "Victor" Ice Machine we candidly believe that we present to them the most perfect machine of the day, and ask their careful consideration before purchasing. We build small machines both double and single acting. Our large machines are double acting. We have at our command some of the finest mechanical talent in the land; men who have had a long line of practical experience in building and operating ice and refrigerating machines; and we have spared no expense in our efforts to present to the trade an effective, reliable machine. Notwithstanding the fact that our machines are new in design, they have been thoroughly tested for ice and refrigerating purposes, and we have a number in successful operation: some in ice factories simply making ice; others in slaughter houses refrigerating meats; others in hotels. This last named is the most difficult work that can be placed on an ice machine, as the duties are so varied. With these machines we make either block or plate ice, freeze the water in bottles for the tables and rooms, refrigerate their meats, fruits, vegetables, eggs, poultry, game, beer, wines, etc., to any desired temperature.

Every machine is fully guaranteed to work successfully under any conditions named in the specifications under which they are sold.

THE STILWELL-BIERCE & SMITH-VAILE CO.

DAYTON, OHIO.

Facts for Ice Consumers.

The advantages of using machinery for producing cold as compared with the use of ice for the same purpose are many. In the first place is the relative cost of the two methods; the cost of the natural product varying with the seasons of the year and also with the variation of supply and demand; the cost of producing artificial cold by a reliable and highly efficient machine, as the Victor machine, remains the same the year round, and is much cheaper for the same amount of ice required, even when the market price of that commodity is at its lowest.

The lowest temperature obtained by means of melting ice is from 48° to 50° F., while with these machines we are able to bring the cooling rooms to any temperature desired.

The space required in the ice box or cooling room for the storage of the ice, is excessive; in fact, in many cases, occupying more space in the room than the stock to be kept cool, while our apparatus in the cooling room consists of but a few lengths of pipe hung to the ceiling or walls of the room, out of the way, and thus leaving the whole interior for the storage of stock.

Natural ice contains, always, a certain amount of impurities, gaseous and solid, no matter where it is obtained from, and especially so when cut from ponds of stagnant water. These impurities are imprisoned in the ice and released only when the ice is melting. As this occurs in the cooling rooms, these impure gases and solids contaminate the air in the cooling rooms, which, in turn, contaminates the stock, thereby tainting it and hastening putrefaction. In many cases the stock would be in much better condition if left outside, exposed to the ordinary temperature. With our apparatus the air in the rooms remains as fresh and as wholesome as that outside.

With melting ice, the temperature of the cooling rooms is not under control; in fact, we must be contented with whatever temperature the melting ice may choose to give us. With our refrigerating machinery, any desired temperature may be obtained and may be

changed to any other degree of cold at any time; that is, the regulation of the temperature of the cooling rooms is always at our command.

Ice, while melting in the cooling rooms, loads the enclosed air with vapor almost to the point of saturation; and, of course, this cool, wet air comes in contact with the stock, hastening decomposition. With our apparatus, **no moisture is added to the air in the rooms; in fact the air is "dried" to a great extent**, this moisture being deposited on the refrigerating coils in the room in the form of **frost**.

It is needless to point out the many inconveniences and petty annoyances in the use of ice for cooling purposes, as nearly every one has been subjected to them, the sweet will of that autocrat, the "ice man," the cleaning of the ice of saw dust, etc., the time and disagreeable labor spent in storing it in the cooling rooms, the accumulation of water resulting from its melting, and many other petty annoyances which must necessarily be borne from the use of ice for cooling purposes. With our apparatus, all that is necessary to do is to oil a few bearings, start the machine, turn on a faucet of water and—**we do the rest**.

Artificial Refrigerating and Ice Making.

Among the most beneficial results obtained by mechanism stands that of Mechanical Refrigeration and Ice Making. For a time it seemed as if these machines would only find a home in the larger cities in the tropics. This has proved a delusion, and we find to-day these machines running and producing ice where rivers and lakes are frozen over, thus competing with nature in the frozen regions. Last summer we built a machine for a natural ice company; we found this machine running during the winter when this company had a crew of men on the river harvesting natural ice. We questioned them as to why they were running the machine when ice was so abundant. Their reply was, that the ice made with our machine was so far superior to natural ice that many of their customers would have no other. For verification of this, we refer you to The Riverdale Ice Co., of Dayton, Ohio.

We predict that the time draws nigh when every hamlet, every hotel and many private residences will have their own ice machines.

We have built machines as small as 500-pounds ice making capacity in twenty-four hours, and there are many conditions under which these small machines can be operated profitably.

Systems of Refrigeration.

There are several systems of refrigeration in the production of artificial cold, the two principal ones being the brine and the direct expansion systems.

In the former, the liquid ammonia is allowed to expand to a gas in coils of pipe, which are immersed in a tank containing a strong brine; the result is to reduce its temperature; and as the brine can be cooled very much below the freezing point of water without solidifying, it can be brought down to a very low degree. By means of a circulating pump, the brine is then forced through coils of pipe or troughs in the cooling room, absorbing the heat, and then returned to the tank to be again reduced in temperature.

In the direct expansion system, the liquid ammonia expands directly into the coils of pipe in the cooling rooms.

Each system has its advantages; in the brine system, the first cost is greater, but the cold brine can be circulated through the rooms while the compressor is undergoing any repairs, or shut down for the night; on the direct expansion system, the first cost is much less, and a higher efficiency of the machine is obtained, owing to the fact that there is considerable loss in cooling the brine, which, in turn, is obliged to cool the rooms.

While we can furnish either system, we are in favor of the brine system in large machines, and direct expansion with our reserve storage apparatus on small machines.

Refrigerating Machinery—Its Defects.

There are many firms throughout the country engaged in the manufacture of refrigerating machinery, but they all build machines of large capacity, from twenty-five tons upward.

They, together with many individual experimentalists, have attempted to build machines of small capacity, in order to meet the demands of those who require less refrigeration, such as hotels, restaurants, creameries, butchers, etc., and have not made a success of it.

The use of Oil as a Lubricant in the Ammonia Compressor was the primary cause of their failure. The disastrous effects of injecting oil into the compression cylinder, which is in general use among ice and refrigerating machine builders, are too numerous

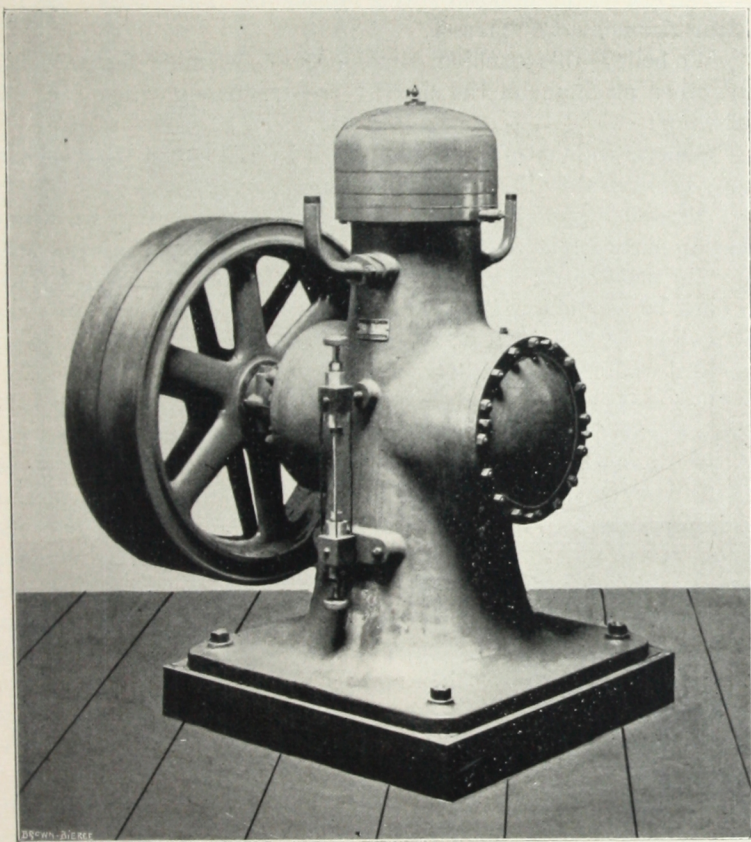
for us to mention all of them, therefore we will only speak of the most important. Heating and compressing oils to the extent that they are heated and compressed in the compressor, combined with the chemical action of the ammonia, generates dangerous inflammable gases that are liable to ignite when a joint is loosened, or cylinder head removed, and explode with disastrous results. Next, the oil in passing from the compressor to the condenser forms a coating on the inner side of the coils and thus cuts down the condensing capacity. It also passes to the expansion coils and diminishes their capacity to an extent that often forces the necessity of stopping in the midst of a busy season, consuming many days in disconnecting and cleaning coils. We never inject any oil in our cylinder, in fact we guard against the possibility of oil entering the cylinder. There is no need of oil in a properly constructed compressor cylinder, and it is only to cover bad mechanism that it is used.

In attempting to overcome this fearful defect, some attempts have been and are still being made to lubricate the cylinder with saturated ammonia gas; a delusive hope. Seeing the glaring defects of the oil system, and believing it to be impossible to construct a compressor so perfect that no lubrication would be necessary, these benighted beings have been drawn into the fatal mistake of making an expansion cylinder of their compressor while on the suction stroke; the liquid gas being sprayed into the heated cylinder expands very rapidly, forming a back pressure and retarding the expansion in the expansion coils, thus curtailing the efficiency of the entire machine.

You ask, How do we avoid all these objectionable features? Simply by attaining a high state of perfection in the mechanical construction of our machines. In other words, being more cautious, using a higher grade of material, more perfect tools, more thorough mechanics, the result is that we have been running machines months without a drop of oil in the cylinders.

Economy of Operation.

Every drop of oil, every drop of liquid gas sprayed in a compressor cuts off its efficiency in ways heretofore spoken of and necessitates a slower piston speed, as there is danger of trapping sufficient oil or liquid gas between piston and cylinder head to knock the latter out. With our machine we have none of these obstacles to contend with, can run faster and get much higher results from a cylinder of equal dimensions than others.



The above cut represents our Single Acting Duplex Automatic Machine, arranged to be driven by belt.

These machines are simple and require very little attention, are perfectly noiseless, and also easily managed. They are the most economical, durable and successful refrigerators on the market. They occupy very little space, and can be run by a belt power, also with steam, gas, gasoline, electric or water motor. This machine will also make small quantities of ice, when required, of a superior quality. We use either the direct expansion system or the brine storage system, or the brine circulation system, as best adapted for the work to be done. Our system of expansion is always in coils of such length as will avoid joints; our fittings are of the very best make and are put up with heavy glands on solid rubber washers. When once made tight, they are bound to hold a life time; our valves are of the best make and latest pattern.

The cut on the opposite page represents "The Victor" Double Acting Ammonia Compressor.

We believe this machine contains more desirable features than any other machine on the market to-day, among which are the following :

General rigidity of construction combined with a pleasing harmony between the different parts of the machine.

Accessibility of all wearing parts; the valves, bearings, and other wearing parts can be removed and inspected in a few moments' time.

The main crank shaft bearings are of ample proportion and are all oiled by ring oilers, thus always insuring a positive and unfailing lubrication with very little attention. All other wearing parts are provided with equally positive lubrication.

Our new and improved stuffing box, packed with metallic packing, has proved itself an unfailing member of this machine.

The compressor cylinder is completely water-jacketed all around.

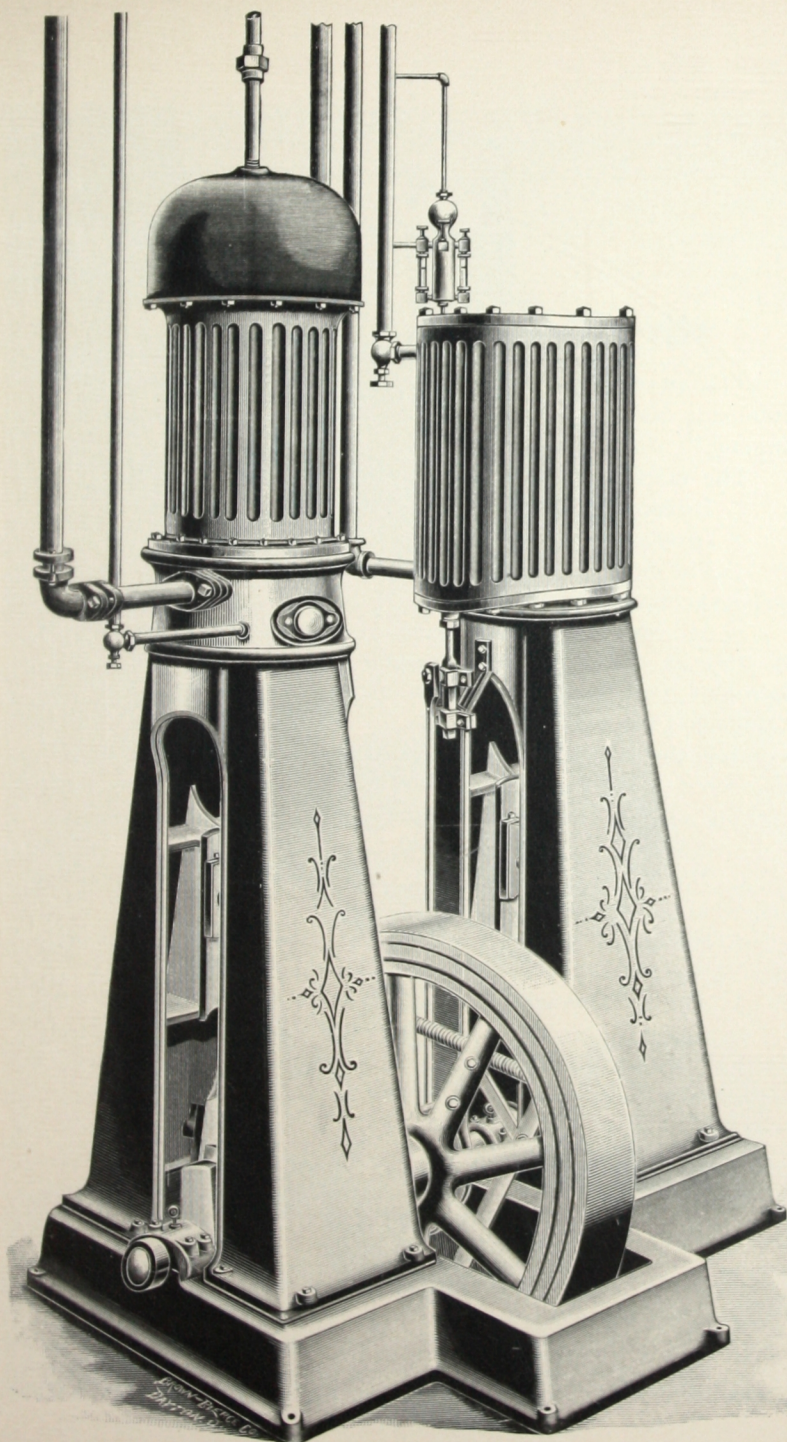
A very excellent feature is the over-traveling central suction port, thus insuring a full charge of suction gas at every stroke of the piston, giving the machine a greater capacity than could be obtained with the same piston displacement without such over-traveling port.

As will be seen from an inspection of the cut, the piping to the compressor is let into the machine below the water jacket, and without interfering with any of the valves whatever. Thus all suction and discharge valves, water jacket, cylinder head, and even piston can be taken out and inspected without disconnecting a single pipe, if necessary.

The suction and discharge valves, being one of the most important elements of an ammonia compressor, have received our most careful attention, and the result is that these valves are the embodiment of simplicity without any detriment to their operation; they are so constructed that they will not become loose and fall into the cylinder. There is positively no oil used in the compression cylinder.

We have designed especially for this machine a vertical automatic cut-off engine, standing on the same base as the compressor, embodying the same general design as far as possible. It is supplied with piston valve, working in a renewable bushing, and a shaft governor for steam regulation. It is in every respect a high-class modern steam engine, and will give as high economy as any other engine of its kind. The governor combines the advantages of both the inertia and centrifugal governors and gives an exceedingly smooth regulation.

The whole machine is of an entirely new design, built on correct principles, and gives the highest mechanical efficiency obtainable in this class of machinery.

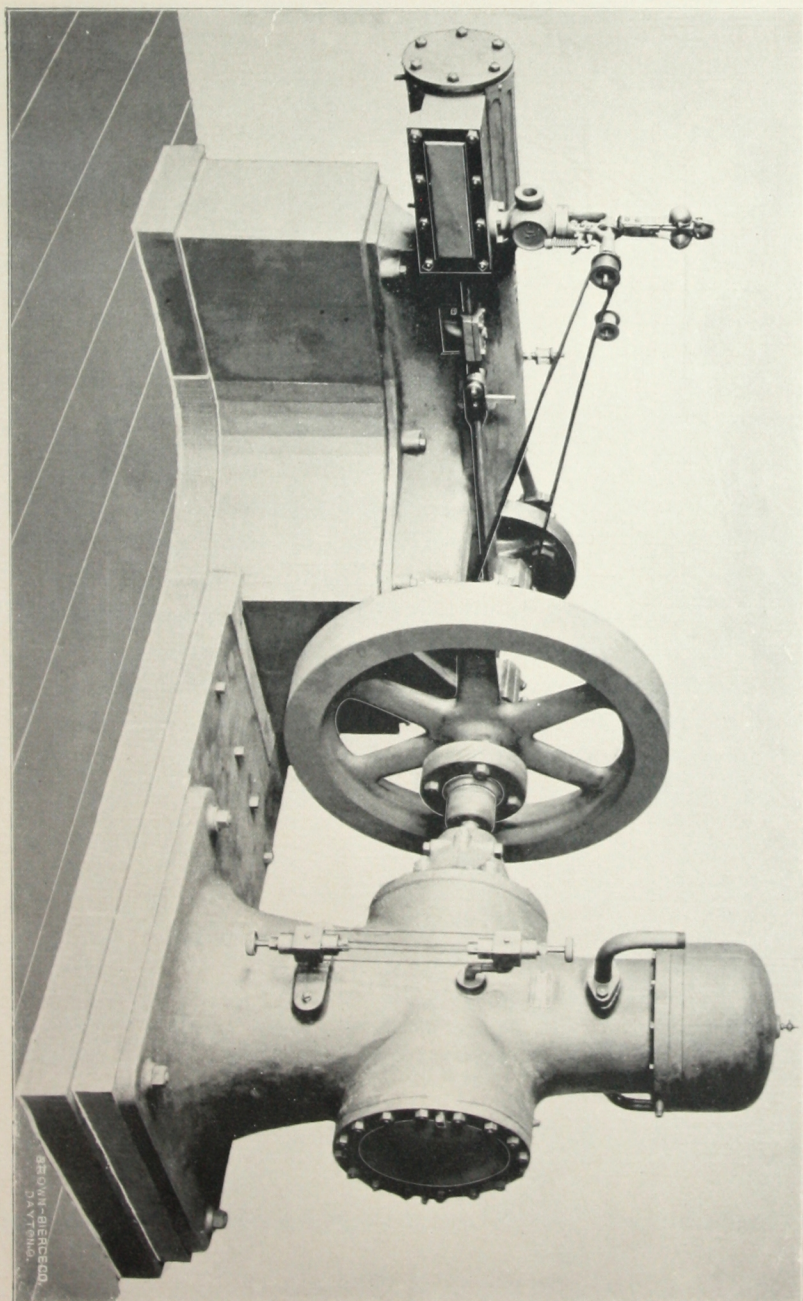


The cut on opposite page represents our Single Acting Duplex Automatic Compressor connected direct to Horizontal Steam Engine.

This machine was designed to embody the following principles:

1. Driven at high rate of speed.
2. Driven by any convenient power.
3. The most simple construction without detriment to the functions of the mechanism.
4. All working parts working in a bath of oil, consequently there are no places to oil on the whole machine. And let it be said right here, that although there are one or two other makers of small Ammonia Compressors who try to obtain the results we have acquired, they fail in this respect, that they do not keep the lubricating oil out of their ammonia. Our machine prevents the oil from working out into the ammonia system, to any appreciable degree.
5. All working parts renewable.
6. No piston rod, stuffing box (which is under any condition, somewhat of a nuisance.)
7. Machine so noiseless that it could work in a parlor, if necessary, at the same time free from the ammonia odor.
8. The machine will give high mechanical efficiency.

Setting boldly out to meet these conditions, we have produced a machine that has fulfilled our own expectations and we believe it is worthy of a leading place in modern refrigeration construction.



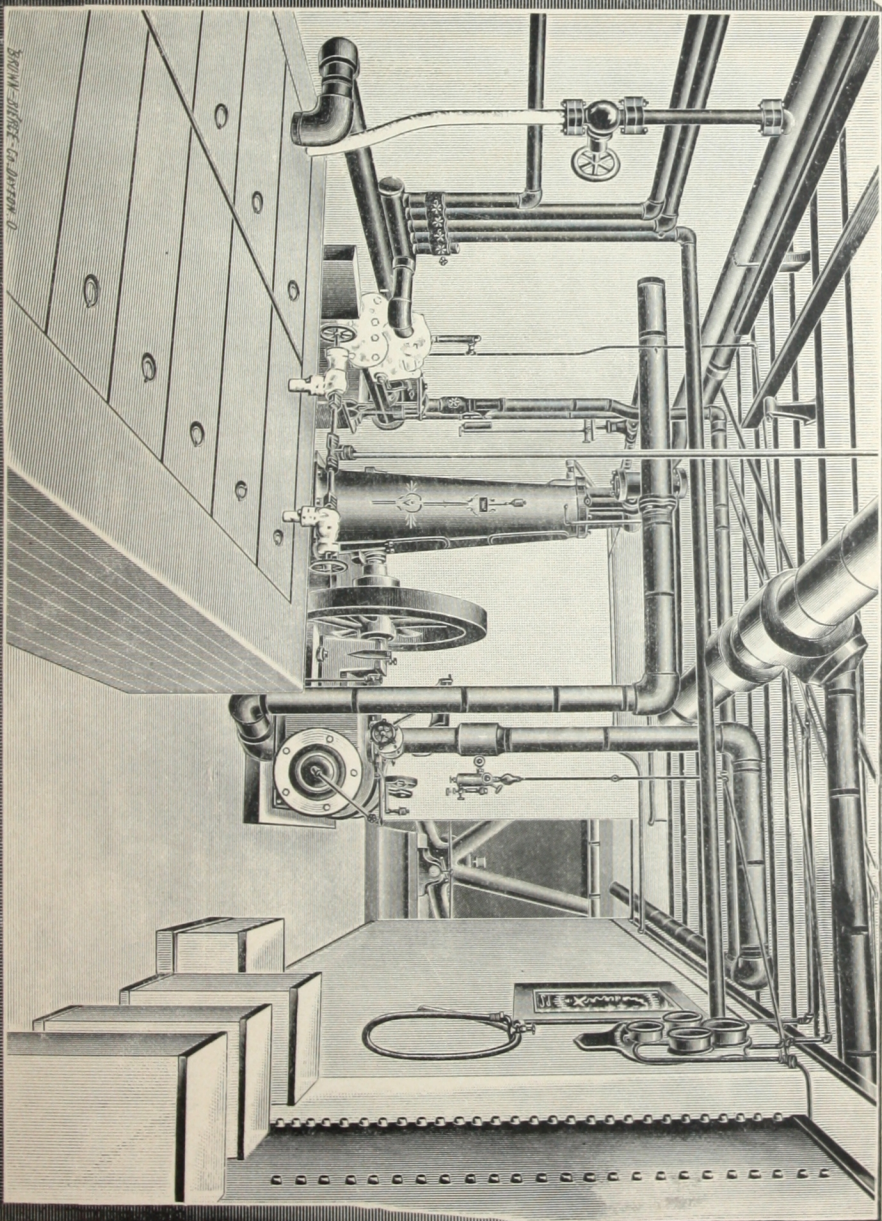
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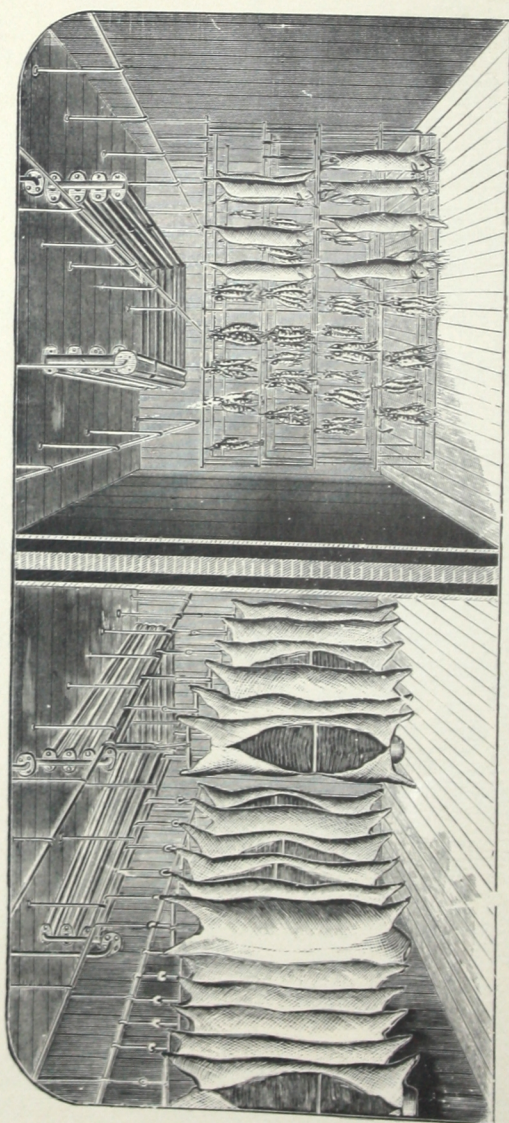
The cut on opposite page represents one of our Double Acting Compressors, with Horizontal Engine in operation, in Gerdes Hotel, Cincinnati, Ohio.

This machine is making block ice, freezing water in bottles for table use, cooling water in the coolers

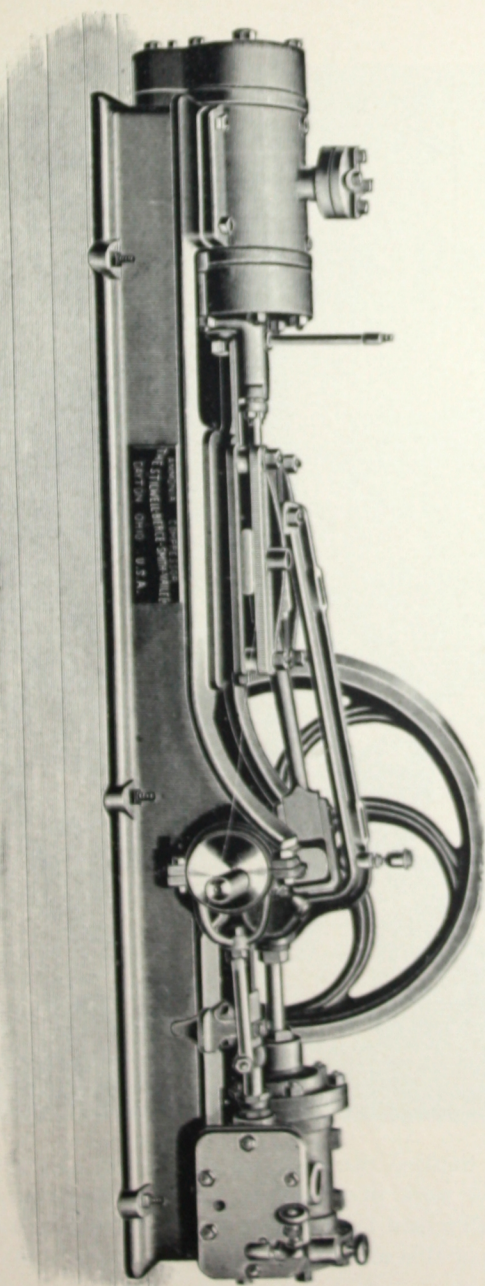
Refrigerating—A Meat and Poultry room, a Vegetable and Fruit room, Milk, Butter and Egg Boxes, Beer room and apartments behind the Bar for Wines and Liquors.

BROWN, SHENK & JARVIS, D.



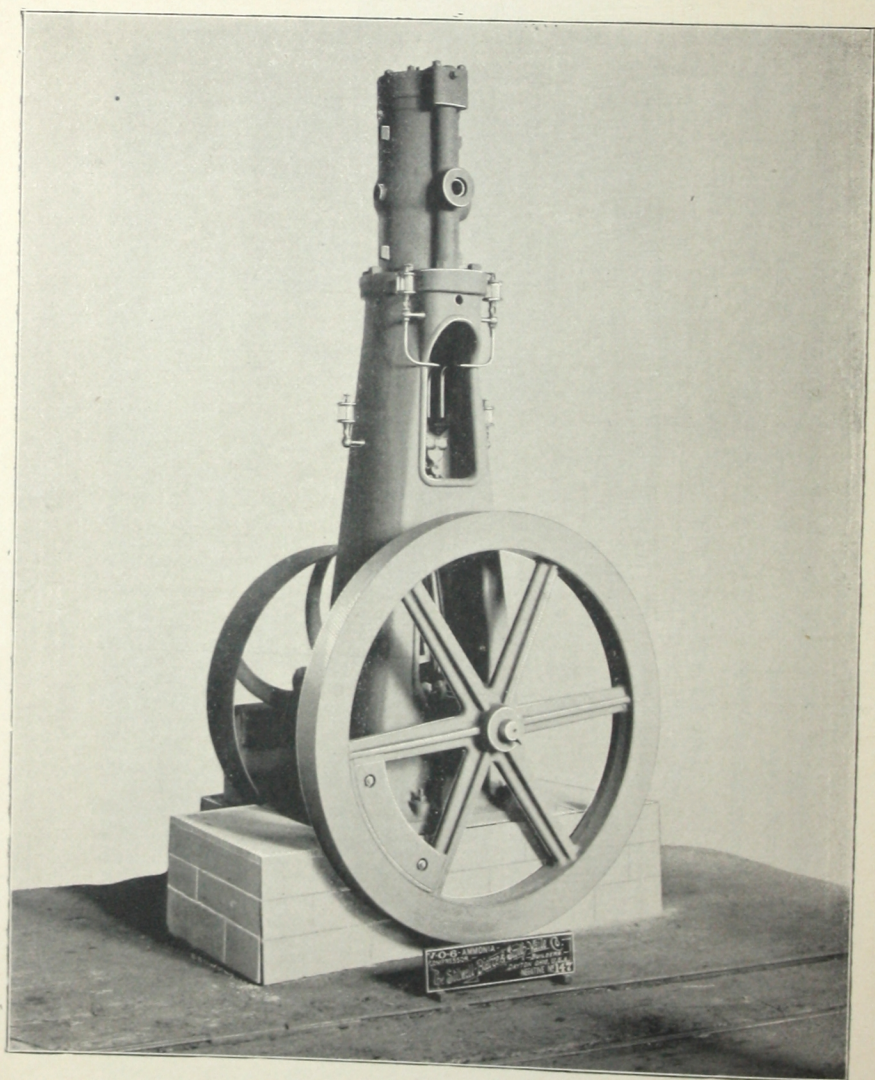


The accompanying cut shows the general appearance of cooling or refrigerating room ; the stock (meat, game, poultry, etc.) suspended from racks. The pipes through which the brine circulates or liquid ammonia expands are suspended from the ceiling, in this case. It is preferable, however, to place the coils in a separate chamber above, when there is room, with an arrangement of warm and cold air flues so designed as to keep up a good circulation of air in the room.



AQUA AMMONIA PUMP.

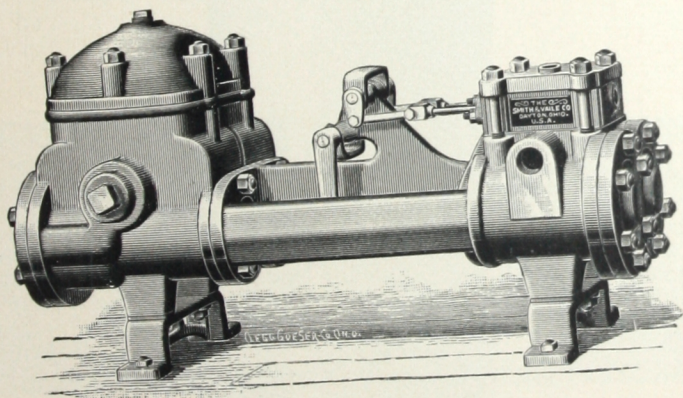
This cut represents our Aqua Ammonia Pump for use in absorption machines. We can furnish on short notice, repairs and fittings for any style of ice machines. Can change absorption into compression system, furnish ammonia or steam condensers, distilled water apparatus, filters and purifier coils, ice cans, ice trucks, tanks, etc.



The Smith-Vaile Vertical Ammonia Compressor, especially adapted for work in connection with ice and refrigerating machinery. With recent improvements, not shown in the engraving, the operation of this machine is very satisfactory in all respects.

We are Sole Manufacturers of the Celebrated

"Smith-Vaile" Steam Pumps,



In great variety of styles and sizes, and designed for every possible service.

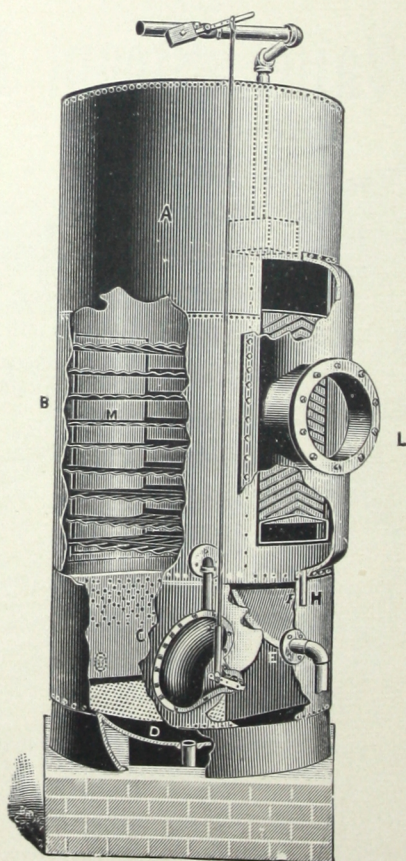
ILLUSTRATED CATALOGUE ON APPLICATION.

The Stilwell-Bierce & Smith-Vaile Co.

DAYTON, OHIO.

STILWELL'S

Patent Improved Open Heater and Filter Combined.



PATENTED, APRIL 29, 1890.

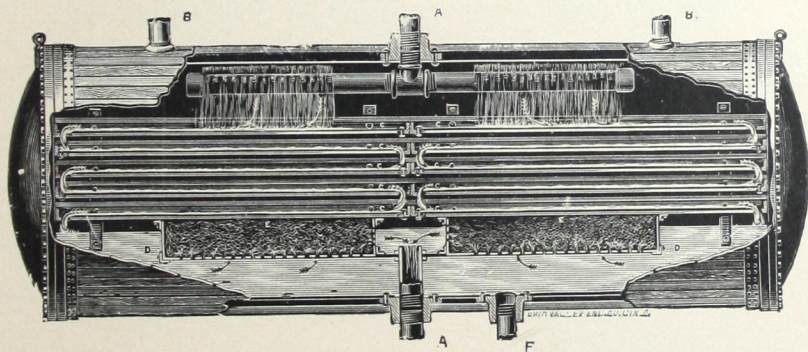
Extracts Lime and Magnesia. Separates Cylinder Oil from Exhaust Steam. Heats feed-water to boiling point. Indispensable to an economical use of Steam.

Illustrated Catalogue on application.

THE STILWELL-BIERCE & SMITH-VAILE CO.

MADE IN
AMERICA

STILWELL'S Patent Live Steam Purifier.



For removing from boiler feed-water Sulphates of Lime, Magnesia, etc., and other scale-producing impurities which require a much higher temperature than can be obtained with Escape Steam.

Full particulars on application to

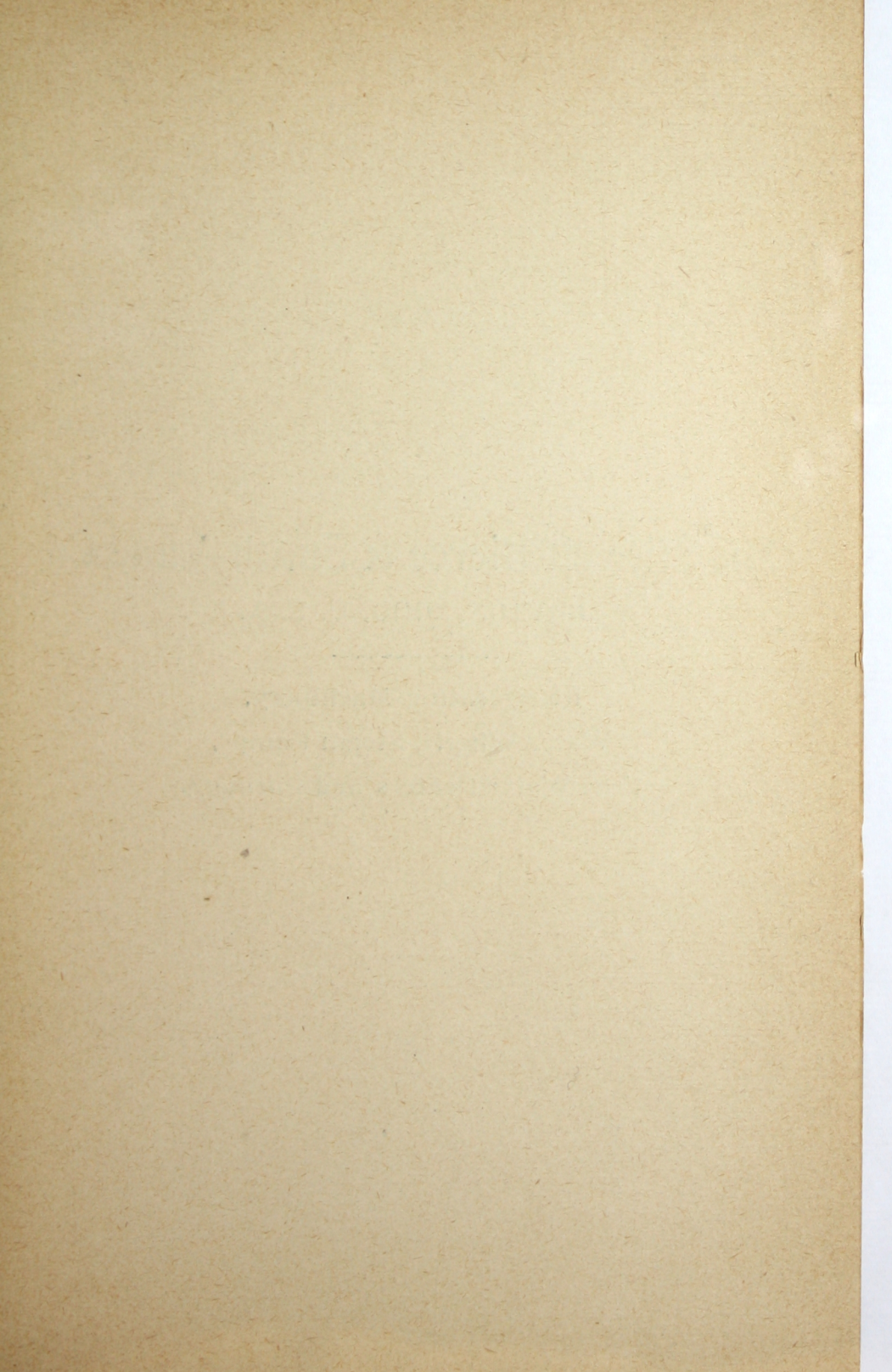
The Stilwell-Bierce & Smith=Vaile Company,

DAYTON, OHIO.

We are extensively engaged in the manufacture of **Gears, Pulleys, Shafting**, and all kinds of **Power Connections**, a full and complete catalogue of which will be furnished on application, all from New and Modern Patterns. We solicit correspondence from all who are wanting anything in that line, and will cheerfully quote prices on receipt of specifications.

THE STILWELL-BIERCE & SMITH-VAILE CO.,

DAYTON, OHIO.



The Stilwell-Bierce & Smith-Vaile Co.

DAYTON, OHIO, U. S. A.

**Refrigerating Machinery,
Water Wheels, Steam Pumps,
Feed Water Heaters and Purifiers.**